Remarks

Claims 1-31 are pending in the above-identified application. Claim 1 has been amended, claims 2-8, 11-16, and 23 were previously presented, claims 9 and 10 are original, claims 17-22 are withdrawn, claim 24 has been canceled, and claims 25-31 are new.

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "multiple sensors ... arranged asymmetrically on the individual" must be shown or the feature(s) canceled from the claims).

With this amendment the "multiple sensors ... arranged asymmetrically on the individual" has been cancelled from the claims. Therefore the objection to the drawings has been overcome, and the Examiner is respectfully requested to reconsider the objection to the drawings.

The Examiner rejected claim 24 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With this amendment applicant has cancelled claim 24, and therefore the rejection of claim 24 is no longer applicable.

The Examiner rejected claims 1-12, 14-16, 23, and 24 under 35 U.S.C. 103(a) as being unpatentable over Kramer (US 5,592,401) in view of Stark et al. (US 2001/0020143 Ai, hereinafter Stark).

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kramer in view of Stark and in further view of Root et al (US 6,013,007, hereinafter Root).

MPEP §706.02(j) states: "To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)."

MPEP §2143.01 provides: "The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. In re Mills, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination. ACS Hospital Systems, Inc. v. Montefiore Hospital, 732 F.2d 1572,1577,221 USPQ 929, 933 (Fed. Cir. 1984)."

One court further noted that there were three possible sources for such motivation, namely "(1) the nature of the problem to be solved; (2) the teachings of the prior art; and (3) the knowledge of persons of ordinary skill in the art." Id. at 1357, 47 USPQ2d at 1458. Here, according to this court, the Board had relied simply upon "the high level of skill in the art to provide the necessary motivation," without explaining what specific understanding or technological principle within the knowledge of one of ordinary skill in the art would have suggested the combination.

The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. In re Mills, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). Prima facie obviousness only exist when the prior art suggests or anticipates the benefits of modifying or combining references or when external factors, such as the changing state of the art, provide the motivation to one of ordinary skill in the art to make the modification or combination. However, where no reasonable intrinsic or extrinsic justification exists for the proposed combination or modification, prima facie obviousness will not have been established.

The black letter law statements by Judge Linn in *In re Kotzab,* 217 F.3d 1365, 55 USPQ2d 1313 (Fed. Cir. 2000) are applicable to the present rejections, viz:

a) Hindsight Syndrome

> A critical step in analyzing the patentability of claims pursuant to section 103(a) is casting the mind back to the time of invention, to consider the thinking of one of ordinary skill in the art, guided only by the prior art references and the then accepted wisdom in the field. ... Close adherence to this methodology is especially important in cases where the very ease with which the invention can be understood may prompt one "to fall victim to the insidious effect of a hindsight syndrome wherein that which only the invention taught is used against its teacher." (Id. at 1369, 55 USPQ2d at 1316) (citations omitted).

b) Need for Motivation

> Most if not all inventions arise from a combination of old elements. ... Thus, every element of a claimed invention may often be found in the prior art. *See Id.* However, identification in the prior art of each individual part claimed is insufficient to defeat patentability of the whole claimed invention. *See Id.* Rather, to establish obviousness based on a combination of the elements disclosed in the prior art, there must be some motivation, suggestion or teaching of the desirability of making the specific combination that was made by the applicant. (Id. at 1369, 55 USPQ2d at 1316) (citations omitted).

c) Particular Findings Required

> The motivation, suggestion or teaching may come explicitly from statements in the prior art, the knowledge of one of ordinary skill in the art, or, in some cases the nature of the problem to be solved. In addition, the teaching, motivation or suggestion may be implicit from the prior art as a whole, rather than expressly stated in the references. ... The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art. ... Whether the Board relies on an express or an implicit showing, it must provide particular findings related thereto. Broad conclusionary

> statements standing alone are not "evidence." (Id. at 1370, 55 USPQ2d 1317) (citations omitted).

The Examiner supported the rejection of independent claim 1 with the following alleged argument:

"For claims 1 and 2, Kramer discloses an apparatus, comprising: multiple sensors that are adapted to be in contact with multiple joints of an individual and produce multiple signals based on multiple joint motions of an individual, said multiple joints including an ankle, knee, hip, waist, wrist, elbow, and shoulder of the individual (column 6 line 17 - column 7 line 35, column 9 lines 42-51, column 10 lines 25-28, column 12 lines 8-17, and column 15 lines 16-19); multiple processing components that employ one or more of the multiple signals to make a determination of a positional change of the individual (column 11 lines 12-25); wherein the multiple sensors produce multiple signals representative of the three dimensional motion of multiple joint motions, said joint motions including the motions of an ankle, knee, hip, waist, wrist, elbow, and shoulder of the individual (column 9 lines 42-64, column 10 line 56 - column 11 line 5, column 11 lines 41-51, and column 15 lines 20-26); and wherein the multiple joint motions are measured and reconstructed from a known starting location and the recorded position information to determine a path traversed by the individual (as best seen in Figure 1, column 4 line 26 - column 6 line 6, and column 17 lines 6-11)."

Kramer is concerned with motion data capture for use by sports trainers and athletes to analyze athletic performance and by the medical community, for example, in gait analysis. See column 1, lines 8-18. In the summary section of the patent Kramer states that apparatus and methods are provided for quickly, accurately and/or reliably determining position of an entity by employing a combination of individual devices where the combination provides a position measurement, which is superior to any of the individual devices comprising the combination when taken separately.

As opposed to the teaching of Kramer the present claimed invention is directed to providing an anthropometric dead reckoning motion detector for a body. "Anthropometric" as used herein refers to measurement of the body. "Dead reckoning" as used herein refers to navigating by measuring the course and distance traveled from a known point. Kramer does not teach or suggest that the Kramer devices be used to track and record a path taken by an individual.

The present invention as now claimed is directed to the use of data from the describe sensors to reconstruct a path of an individual from a known starting location and recorded position information. For example, the path may be used to create a map of an area previously unmapped, incorrectly mapped, or update outdated maps. Thus, the movement of the joints of the individual is reconstructed to determine the path of the individual.

On page 4 of the specification the following is described:

"In one example, the apparatus 100 comprises an anthropometric dead reckoning motion detector for a body. "Anthropometric" as used herein in one example refers to measurement of the body. "Dead reckoning" as used herein in one example refers to navigating by measuring the course and distance traveled from a known point. In one example, the body comprises an individual 102. For example, the individual 102 comprises a person, animal, or robot. The anthropometric dead reckoning motion detector takes measurements of the individual 102 and converts the measurements to a position change starting from a known location."

On page 5 of the specification the following is described:

"As the individual 102 traverses a path from a known starting location, the apparatus 100 serves to measure the movement of the one or more joints of the individual 102 and record the movement. Subsequently, the movement of the one or more joints of the individual 102 is reconstructed to determine the path of the individual 102."

On page 7 of the specification the following is described:

"The navigation component 128 in one example comprises an inertial navigation system 212 ("INS") and/or a global positioning system 214 ("GPS"). The navigation component 128 provides position information of the individual 102 to supplement the position information generated by the processing component 126. In one example, the navigation component 128 is attached to the waist of the individual 102. For example, the navigation component 128 is integrated into a belt for the individual 102."

On page 8 of the specification the following is described:

"The recording device 140 stores the position information output from the filtering component 216. A path of the individual 102 may be reconstructed from the known starting location and the recorded position information. The path may be used to create a map of an area previously unmapped, incorrectly mapped, or update outdated maps. Using dead reckoning navigation to provide information for cartography is especially useful in remote areas where the global positioning system 214 is unavailable, or in areas where the global positioning system 214 in experiencing jamming or interference."

The reference of Stark apparently was cited by the Examiner for depicting the use of sensors on one leg of an individual, and not for tracking an individual.

Therefore, no combination of the cited prior art would result in the claimed invention of the present application. In order to more clearly define the present invention independent claim 1 has been amended to include the feature that the multiple joint motions are measured and reconstructed from a known starting location and recorded position information to determine anthropometric dead reckoning of the individual to thereby construct a path traversed by the individual.

The dependent claims include all the limitations of the respective independent claim upon which they depend, and are therefore also allowable over the cited prior art for the reasons set forth above with respect to independent claim.

New claims 25-31 have been added.

Claims 25 and 26 are directed to monitoring a person to measure the environment that the person is in. This is supported by the specification, for example:

"A path of the individual 102 may be reconstructed from the known starting location and the recorded position information. The path may be used to create a map of an area previously unmapped, incorrectly mapped, or update outdated maps. Using dead reckoning navigation to provide information for cartography is especially useful in remote areas where the global positioning system 214 is unavailable, or in areas where the global positioning system 214 in experiencing jamming or interference."

New claims 27 and 28 are directed to monitor a person to provide feedback to the person or to manipulate, for example, a robot. Feedback to the person is supported by the specification, for example:

"During the run times, the inertial navigation system 212 and the global positioning system 214 may provide corrections to the one or more sensors and/or the processing component 126. Therefore, the position information generated by the inertial navigation system 212, the global positioning system 214, and the processing component 126 would be in better agreement.

Due to the corrections, at a time when the inertial navigation system 212 and/or the global positioning system 214 become unavailable, the processing component 126 would be more able to alone generate an estimate of the position information."

New claims 29, 30, and 31 are directed to the use of many different kinds of sensors, such as, measuring angular rate with gyroscopes, measuring linear motion with accelerometers, etc. This is supported by the specification, for example:

"The third algorithm 206 may additionally take inputs from a magnetic heading sensor 208 and a barometric altitude sensor 210. The magnetic heading sensor 208 provides additional information on the direction of the movement of the individual 102 to supplement the twisting component of the strain sensors. The magnetic heading sensor 208 would use the Earth's magnetic field to sense the direction of the movement. A change in magnetic field measured by the magnetic heading sensor 208 would correspond to a change of direction by the individual 102. The barometric altitude sensor 210 would measure an atmospheric pressure for altitude position changes. A change in atmospheric pressure measured by the barometric altitude sensor 210 would correspond to a change of altitude by the individual 102. The position information generated by the magnetic heading sensor 208 and the barometric altitude sensor 210 would assist the anthropometric dead reckoning motion detector during motion of the individual 102 while the one or more joints of the individual 102 are not in motion. The third algorithm 206 would weigh and combine the position information generated by the magnetic heading sensor 208 and the barometric altitude sensor 210 with the position information generated by the first and second algorithms 202 and 204."

The prior art made of record and not relied upon is considered to be of general interest only. This application is believed to be in condition for allowance, and such action at an early date is earnestly solicited. If a telephone conference would be of assistance in advancing the prosecution of this application, the Examiner is invited to call Applicant's attorney.

Respectfully submitted,

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